IRSTI 06.61.33

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Assessment of the effectiveness of innovative activities of enterprises in the West Kazakhstan region

Annotation. *The article provides a comprehensive analysis of the level of innovative development of the West Kazakhstan region, and examines the importance of innovation in general for improving the competitiveness of the region. A prerequisite for the development of the state's innovation economy as a whole is the analysis of innovative and spatial regional indicators of its individual regions. Therefore, the article provides a comprehensive analysis of the dynamic indicators of enterprises in the West Kazakhstan region for the introduction of innovations and implementation of innovative activities. In addition, the costs of producing product and technological innovations for each region located in the western region have been studied comparatively. Using the induction method of research, the innovative activity of the region was calculated. Based on the results obtained, the main problems and constraints for the development of innovative activity were identified. The innovative activity of enterprises in the West Kazakhstan region was evaluated, and ways of its sustainable and effective development in the future were proposed.*

Keywords: *innovations, innovative activity, regional economy, technological innovations, process and product innovations.*

DOI: https://doi.org/10.32523/2079-620X-2020-4-94-103

Introduction. The development of the innovation sphere in the Republic of Kazakhstan is not a new phenomenon. Based on the experience of the developed countries of Europe, Switzerland, Sweden, the Netherlands and the United Kingdom and the United States, whose innovative activities are mature To achieve success in the dynamically and rapidly developing economy of Kazakhstan, each enterprise should pay special attention to such important issues as innovation, first of all, the introduction of new methods in production, improving its activities, reorganizing structural divisions, optimizing production processes by launching previously unused technologies. Comprehensive development of the innovation sphere is clearly outlined in a number of legal documents and annual presidential Messages. Measures of state support for innovation are provided in the state program of industrial and innovative development of the Republic of Kazakhstan for 2020-2025 [1].

In the context of globalization of the world economy, the creation and development of a competitive innovative economy is one of the priority tasks for Kazakhstan. However, according to the statistics Committee of the Republic of Kazakhstan, current indicators of innovation development show weak dynamics: over the past 10 years, the share of R & d expenditures in the GDP structure has decreased from 0.3% to 0.17%, the number of innovative patents has decreased from 478 to 1 unit in three years. Nevertheless, the volume of innovative production continued to grow steadily — its share in relation to GDP increased from 1.46% to 1.98% over the past five

years. It is likely that by the end of 2020, this indicator will decrease due to the crisis caused by the COVID-19 pandemic. However the main priority directions of economic development in the West Kazakhstan region are the transition from the export and raw materials path to the innovative path, which determines the relevance of the article.

Goals. The purpose of the article is to analyze the implementation of innovation activities at the regional level of Western Kazakhstan and assess its effectiveness.

Problem statement. To achieve this, the goals are the following:

1. Definition of methods of research depending on the purpose of writing and the collection and analysis of data of the statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan (hereinafter-MNE RK) of West Kazakhstan region;

2. Determination of the share of enterprises in the West Kazakhstan region engaged in innovative activities and assessment of their activities; and

3. Identify and propose solutions to problems based on the results obtained.

The object of the research is enterprises that have introduced innovative activities in the economic process of the West Kazakhstan region.

As a theoretical and methodological basis for the study, the works of domestic and foreign economists on improving innovation were obtained. The article uses official statistical data for the western region of the Republic of Kazakhstan as the basis for the analysis.

Research methods. The research was conducted on the basis of monographic, economic-statistical and induction methods. A warning situation, the problem of lack of statistical information in the innovation sphere causes several difficulties in the analysis of innovation activity in the regions. Many indicators of the Committee on statistics of the MNE of the Republic of Kazakhstan that characterize innovation activity in the regions are insufficient during the analysis, as this is due to the lack of standards that clearly define such concepts as innovation, innovation activity in the regions, and innovative products.

History. To activate the innovative development of the economy of Kazakhstan, state support is of great importance, since it is known that companies have a low propensity for technological and organizational innovations in the real sector. When implementing innovative activities in the economic process, the company needs to ensure that the company›s revenue increases through retraining of personnel and modernization of the production process. Currently, according to the Statistics Committee of the Ministry of national economy of the Republic of Kazakhstan for 2019, the total innovation activity of enterprises in the country is 11.3%, including 7.3% in the West Kazakhstan region. That is, the innovation activity of the western region with a high innovation potential is lower than the national average. The higher the innovation process at enterprises, i.e. the increase in innovation activity, the greater the share of the Western Region in Kazakhstan›s gross domestic product (hereinafter referred to as GDP). It is obvious that the innovative potential of each region is dominated by some innovative resources. Depending on the priority types of available resources:

a. Regions with human resources potential;

b. Regions with sustainable financial innovation potential;

c. Regions with active innovation potential;

d. Regions with institutional and infrastructure innovation potential; and

e. Regional divisions with universal innovative potential into several groups. Among them are all groups associated with the production industry of the West Kazakhstan region. Because the regions of the West Kazakhstan region have institutional and infrastructure innovation potential.

To assess the effectiveness of innovation activities in the regions of the Republic of Kazakhstan, we use an analysis model grouped into the following 4 sections. In particular, the first group includes areas with high scientific and production potential and requiring the introduction of technological science in production activities, the second group includes areas with unique reserves of mineral resources and a fairly high level of development

of scientific and production potential. The next third group includes areas where agro-industrial complexes are the leading industry, the last group includes areas in the conditions of economic and environmental crisis. The second group of the above-mentioned regional model includes: West Kazakhstan, Atyrau, Mangistau and Aktobe regions of the western parts of the Republic of Kazakhstan, obtained as the object of research. After all, the economic zone of western Kazakhstan is the largest oil and gas producing region of the country. The largest oil and gas fields in the world — Tengiz, Karachaganak, Kashagan- are located in the region. The region has a large mineral resource base-hydrocarbon raw materials, oil, gas, zinc, chromium, phosphorite, copper, aluminum, nickel, titanium and coal.

Chemically pure Chromium salts are produced by the Aktobe chromium compounds plant on the basis of local raw materials. Ferroslav JSC produces metal chromium and carbon-free ferrochrome. In addition to the main product, calcium carbide, liquid glass and refractory products are produced. Atyrau oil refinery will increase its capacity for the production of gasoline of various brands, diesel fuel and other types of products. The Kazakh gas processing plant is located in Zhanaozen. Aktobe paint and varnish plant, as well as chemical combine for the production of boron, sulfuric and boric acid, a large range of mineral fertilizers (Alga) continue to expand their production. The region develops mechanical engineering (JSC»Ural plant» Zenit» — shipbuilding, JSC «Aktoberentgen» — production of X-ray equipment), metalworking, light and food industries. Agriculture (Animal Husbandry, crop production, meat and dairy, bakery, fish processing industry (JSC»Atyrau Balyk»), etc. However, these natural resources are limited, so based on the experience of foreign countries in diversifying the economy and developing an innovative economy, the transition to an innovative economy is gradually beginning in Kazakhstan. As proof of this, the implemented directions of the state program of forced industrial and innovative development of the Republic of Kazakhstan for 2014-2019, as a prerequisite for the innovative development of the economy of the western industry of the country, gave effective positive results [2].

Currently, there is a need to transition the economy of the West Kazakhstan region to an innovative development path with increased competitiveness. The current resource-oriented model of processing the national economy cannot achieve growth rates without compromising the social and environmental situation.

Most research in the field of innovation is related to the definition and detailed analysis of the scientific side (structural factor) of innovation processes, but much attention is paid to ensuring the demand for innovations in society and public production, creating conditions for their acceptance, dissemination and use, in turn, issues that affect the efficiency, pace and scale of the process of generating and developing news.

Available macroeconomic data in Kazakhstan show a very low degree of both the degree of innovation activity and the number of innovative companies (There are only 296 innovations in Kazakhstan out of 4047 companies). The result of innovation activity is heterogeneously affected by different sectors of the economy, and the insufficient number of innovative companies reduces the ability to implement innovation. The intensity of links between science and production can be determined by the size of cash flows between organizations engaged in innovative activities. These flows define the relationship between science and production. Systematizing the above-mentioned topics, the main issues of innovation development in all regions can be divided into the following groups:

1. Low level of commercialization of innovative projects, due to:

a. the monopoly of the existing industries in the regional economy and low competitiveness, which in turn causes a low demand for innovative products and services;

b. compliance with intellectual property rights;

c. the gap in the field of business and science;

d. lack of tax support system;

e. low communication between researchers and R & D companies; and

f. lack of specialists in the field of innovation commercialization.

Table 1

Share of enterprises and organizations that have innovations within all organizations by regions of the West Kazakhstan region

	2016		2017		2018		2019	
	Total enterprises, units	Including those with innovations, units.	Total enterprises, units	Including those with innovations, units.	Total enterprises, units	Total enterprises, units	Total enterprises, units	Total enterprises, units
in the West Kazakhstan region	917	33	932	49	952	50	834	44
in Atyrau region	1193	101	1145	92	1161	96	1081	97
in Mangistau region	1060	43	1131	40	1128	45	988	34
Aktobe region	1234	115	1149	116	1174	125	1144	121
Total	4404	292	4357	297	4415	316	4047	296
Note-compiled by the author on the basis of data From the Committee on statistics of the MNE of the Republic of Kazakhstan.								

2. Low efficiency of implemented innovative projects, its reasons include the following:

a. insufficient involvement of raw materials companies in innovation processes in the Western region;

b. reduced demand for innovative products;

c. underdevelopment of equity capital and unification of the innovation financing system;

d. lack of infrastructure for the functioning of enterprises in the field of production and services, which are the main ones for the Western region; and

e. lack of specialists in innovation managers [3, art. 124-125].

Results. The effectiveness of the innovation economy can be ensured by stable development and high organization of innovative business in the region. At the same time, the country has created prerequisites. For example, there are incubators and accelerators in Kazakhstan, there are venture investors, and some Kazakh startups were able to attract millions (in dollars) of investments. Initially, there were attempts in Kazakhstan to build a startup ecosystem on the model of Silicon valley, but in recent years the course has changed — the ecosystem is formed taking into account the local market. State regulation of innovation activities (legal, financial) must be built taking into account the characteristics of the regional economies. In this case, regional management aimed at implementing the model of innovative and sustainable development is important. This development model provides for the creation of a regional environment for the operation of high-tech and resource-saving industrial production, the exchange of knowledge and technologies among stakeholders at various levels, stimulation of innovative activity, formation and improvement of innovation infrastructure, creation of an effective system of communication between innovation actors, and so forth, to achieve this goal should determine the proportion of enterprises actively using the most innovative in the region (table 1).

As can be seen from the table, among all enterprises in the West Kazakhstan region, the share of innovations in 2018 increased by 8.2% compared to 2016. But in 2019, there is a reversal of indicators. In comparison with 2018, in 2019, the number of enterprises with innovative activities decreased by 20. However, for an objective assessment of the pace of innovation activity development in the region, it is not enough to consider only one indicator. Therefore, it is important to analyze the structure of costs for technological innovations by types of economic and innovative activities. Since information about these costs allows, first, to determine the share of costs in the form of services such as research and development in the implementation

Table 2

Volume of expenditures on technological innovations by regions of the West Kazakhstan region, million tenge

	2016			2017			2018			2019		
	Total	Production innovations	Process innovations	Total	Production innovations	Process innovations	Total	Production innovations	Process innovations	Total	Production innovations	Process innovations
in the West Kazakhstan region	25405,4	12703,8	12701,7	6556	2163,9	4392,2	12153,6	11741,1	412,5	8982,0	6549,4	2432,5
in Atyrau region	491329	13900,1	477428	141593	4882,1	136711	90678,8	10837,9	79840,9	44 270,6	2016,8	42253,8
in Mangistau region	1103,6	267,5	836,1	5673	160,2	5512,8	2548,1	509,3	2038,8	3129,7	1391,3	1738,4
in Aktobe region	23479,7	16269,2	7210,6	54991,4	34815,1	20176,2	56996,3	41966,6	15029,7	59732,0	48682,7	11049,3
Total:	541317	43140,6	498177	208814	42021,3	166792	162377	65054,9	97321,9	116 113,9	58 640,2	57 474
Note-compiled by the author on the basis of data From the Committee on statistics of the MNE of the Republic of Kazakhstan.												

of technological innovations in the economic process of enterprises, and second, to describe the share of costs for the development of new products and production methods by reducing the cost of purchasing machinery and equipment. Thus, special attention will be paid to developing innovations, rather than scaling them.

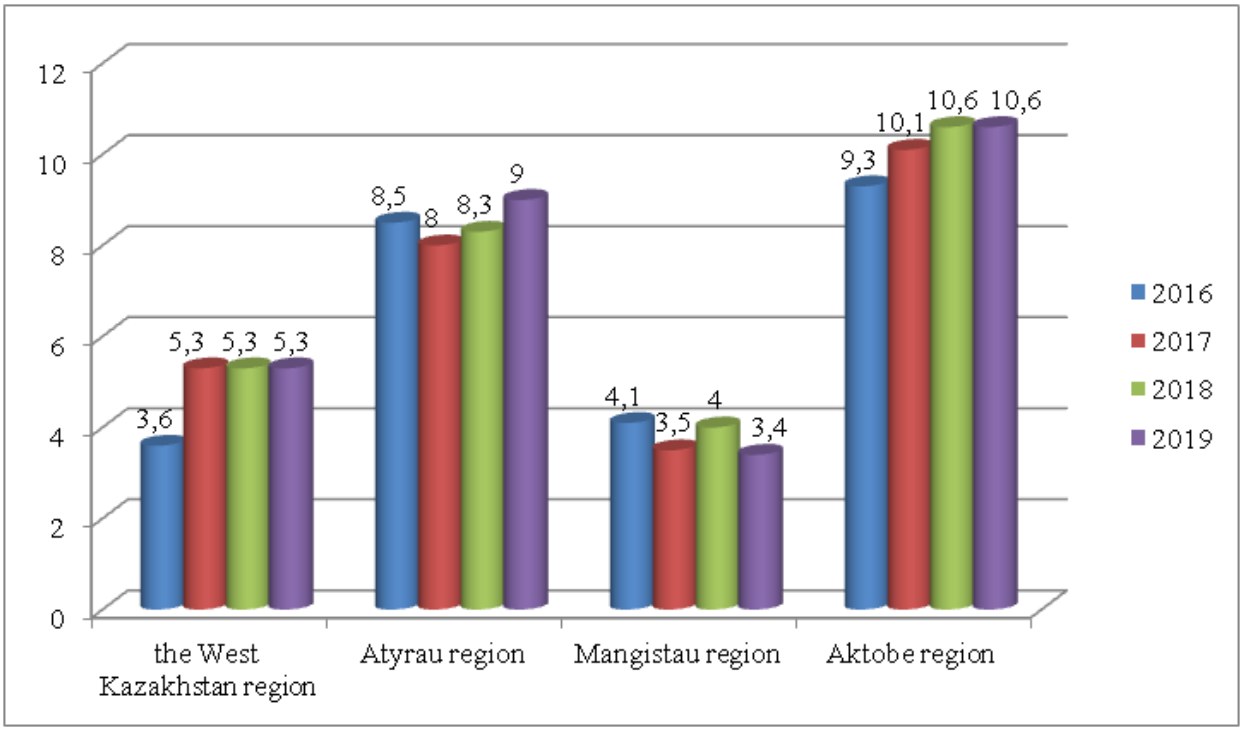
To get a full reflection on the level of financing of technological innovations within the regions of the West Kazakhstan region, it is necessary to conduct a comprehensive monitoring of the share of expenditures on innovative activity of organizations (table 2).

The volume of expenditures on technological innovations in the regions of West Kazakhstan region in 2016 amounted to 541317 million tenge, this amount was reduced by 38.6% in 2017 to 208814 million us dollars.in 2018, compared to 2017, it decreased by 30%. According to the indicator for 2019, the total volume of spending on technological innovations in the western region increased by млн 116,113.9 million. tenge.

Despite the increase in the number of organizations with innovations, it is necessary to determine how effective their innovation activities are. To determine this, it is necessary to annually analyze the main indicators of innovative activity of enterprises for all types of innovations.

Note-compiled by the author based on data From the Committee on statistics of the MNE of the Republic of Kazakhstan.

As can be seen from the drawing, the highest indicator of innovation activity for four years is shown by Aktobe region. Here, in 2019, compared to 2016, there was an increase of 1.3%. The lowest



1 scheme - Main indicators of innovative activity of enterprises for all types of innovations, %

figure is in Mangystau region. Activity here has decreased from 4.1% to 3.4% over the past four years. The activity indicators of Atyrau region and West Kazakhstan region are at an average level. However, Atyrau region shows an increase of 0.5% compared to 2019.

In some cases, the indicator of the effectiveness of innovative development may have a relatively high value than the indicators of localization of low resources and/or results of innovative activities (for example, Aktobe and Atyrau regions). This is due to the fact that the increase in the innovative potential of Atyrau region is carried out on the basis of industrialization. Thanks to industrialization, the region›s economy is being diversified. If earlier the future of Atyrau›s economy was connected only with the oil and gas industry, today new business areas are emerging. These indicators indicate a higher level of innovative development of these regions than in other regions of the region. From an economic point of view, a relative increase in the level of innovative development, despite the negative impact of small amounts of innovative resources in the region, also indicates a good economic development climate (for example, in the West Kazakhstan region).

Discussion. 1. The law «on state support for industrial and innovative activity of the Republic of Kazakhstan «States that» industrial and innovative activity is the activity of individuals or legal entities associated with the implementation of industrial and innovative projects or the promotion of domestic processed goods to the domestic and foreign markets, taking into account environmental safety in order to increase labor productivity and provide incentives for the development of priority sectors of the economy». [4]

2. Local scientist Yerzhan Amirbekovich, who studied the result of innovative activity, determined that in his textbook «Innovative business», the innovation process consists of actions of a specific idea to achieve the final results and the result is manifested in the form of innovative products, services, works. [5, 21 P.]

3. Local scientist A. Bakirbekova in the textbook «management of innovative projects» noted the need for a comprehensive analysis to calculate, control and reduce the risk of innovation and consider ways to reduce costs based on an effective program of innovation implementation. [6, p. 176.]

4. The current situation in the country remains a weak point of the national innovation system for creating effective mechanisms for implementing and supporting innovations. There is an opinion that innovation activity in the Republic of Kazakhstan is local in nature, there is no full preparation for the implementation of national innovative development programs. Therefore, in their works, Kazakh scientists B. issabekov and L. mukhambetova clarified that the prevention of such negative trends in the economy is one of the priorities of development for the state. [7, 25 P.]

5. The features of analysis and management of innovation processes have been studied in the work of many foreign scientists, among which the works of I. Schumpeter can be distinguished. In her work «theory of economic development», she considers an innovative economic system as contributing to its transition from one position to another. It highlights 5 main reasons for innovation: the use of new sources of raw materials; the use of new equipment, technological processes or new market requirements; changes in the organization of production and its logistics; introduction of products of a new character; the emergence of new markets. [8]

6. Clayton Christensen and his colleagues in the work» theory of innovation as a tool for predicting industry changes «emphasize the importance of innovation by companies:» company innovation allows new businesses to ensure sustainable growth using innovative products in the market and displace competitors who have stabilized in the market.» [9, 19 P.]

Conclusion. The global economy over the past decade has shown that innovation plays an important role in developing the competitive advantages of enterprises and countries, providing strategic competitiveness for leaders of innovation processes. Currently, the global innovation market experts predict about 1 trillion US dollars. For example, in the middle of the first decade of the 21st century, the United States amounted to $ 690 billion. in the amount of dollars for innovative products of the region. Japan-600 billion US dollars, China-138 billion US dollars. At the same time, the post-Soviet countries are slightly behind, including Russia – $ 3.9 billion. Innovative products were transported. Kazakhstan-only 1.54 billion US dollars. [7, p. 247] In particular, the indicator of activity in the innovation market of the West Kazakhstan region is on average equal to 7,3%. In order to increase this indicator, it is necessary to address the above issues. To do this, you need to perform the following system of measures:

- to consider measures to attract foreign capital and entrepreneurs in order to increase competition (because in the current crisis, the state cannot increase public spending, which may weigh on the budget and lead to an increase in tax rates);
- improvement of legislation on patent commercialization and intellectual property protection. An innovative economy cannot develop effectively if an innovative product that is the result of intellectual activity is not protected by a patent. Over the past five years, Kazakhstan has issued 2,680 innovative patents. The largest number of patents was in 2014 and 2015 — 1093 and 1096, but over the past year it has declined sharply. [11].
- transformation of large regional universities and research centers into large innovation clusters in order to strengthen ties between science and business;
- adoption of tax incentives for the commercialization of R & D;
- deepening research and development in order to introduce innovative technologies into the production process;
- diginity frames;
- in order to increase the export and import potential in the regions, it is necessary to provide information support for innovative projects;
- attracting funds from individual entrepreneurs to Finance high-tech projects;
- formation of the necessary infrastructure for the effective functioning of innovative projects in the life cycle; and
- training or attracting professional managers engaged in innovation activities to the region.

Summing up, the solution of these problems can further effectively improve the innovative development of the economy of the region of Western Kazakhstan. This will certainly lead to an increase in the economic development potential of the West Kazakhstan region.

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Батыс Қазақстан өңірі кәсіпорындарының инновациялық қызметінің тиімділігін бағалау

Аннотация. Мақалада Батыс Қазақстан өңіріндегі инновациялық даму деңгейіне кешенді талдау жүргізіліп, жалпы аймақтың бәсекеге қабілеттілігінің артуындағы инновациялық қызметтің маңыздылығы зерделенген. Мемлекеттің тұтастай инновациялық экономикасының даму алғышарты - оның жекелеген өңірлерінің инновациялық және кеңістіктік өңірлік көрсеткіштерін талдау болып табылады. Сол себепті мақалада Батыс Қазақстан өңірінде орналасқан кәсіпорындардың инновацияларды енгізу және инновациялық қызметті іске асыру бойынша динамикалық көрсеткіштеріне кешенді талдау жүргізілген. Сонымен қатар, Батыс өңірінде орналасқан әрбір облыс бойынша өнімдік және технологиялық инновациялар өндірісіне жұмсалған шығындар салыстырмалы түрде зерттелген. Зерттеудің индукциялық әдісін қолдана отырып, өңірдің инновациялық белсенділігі есептеліп, алынған нәтижелер негізінде инновациялық қызметтің даму барысындағы тежеуші факторлар мен негізгі мәселелері анықталды. Батыс Қазақстан өңіріндегі кәсіпорындардың инновациялық қызметі бағаланып, оның болашақтағы бірқалыпты тиімді даму жолдары ұсынылды.

Түйін сөздер: инновация, инновациялық қызмет, аймақ экономикасы, технологиялық инновациялар, үдерістік және өнімдік инновациялар.

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Оценка эффективности инновационной деятельности предприятий в Западно-Казахстанском регионе

Аннотация. В статье проведен комплексный анализ уровня инновационного развития Западно-Казахстанского региона, изучена значимость инновационной деятельности в целом для повышения конкурентоспособности региона. Предпосылкой развития инновационной экономики государства в целом является анализ инновационных и пространственных региональных показателей отдельных ее регионов. Поэтому в статье проведен комплексный анализ динамических показателей предприятий Западно-Казахстанского региона по внедрению инноваций и реализации инновационной деятельности. Кроме того, сравнительно изучены затраты на производство продуктовых и технологических инноваций по каждой области, расположенной в Западном регионе. С использованием индукционного метода исследования была рассчитана инновационная активность региона, на основе полученных результатов были определены основные проблемы и сдерживающие факторы развития инновационной деятельности. Была оценена инновационная деятельность предприятий Западно-Казахстанского региона, предложены пути ее устойчивого эффективного развития в будущем.

Ключевые слова: инновации, инновационная деятельность, экономика региона, технологические инновации, процессные и продуктовые инновации.

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